intraocular pressures (21 to 24 mm of mercury) and has even been extended by some to include patients with higher pressures but no field loss or optic nerve damage.

Promotion of the term ocular hypertension has confused some physicians and many patients. It is not a unique entity, nor does it represent a class of patients resistant to abnormal intraocular pressures. Such patients should be suspected of having glaucoma, and frequently become glaucomatous. In clinical studies of persons with "ocular hypertension" the incidence of short-term field loss has ranged from 3.5 percent to 15 percent. Discriminating between ocular hypertension (frequently glaucoma at an early stage) and established chronic simple glaucoma depends upon the status of the optic disc and the visual field. Thorough and periodic examinations are a requisite to proper diagnosis and management. These patients should be followed much more carefully than the general ophthalmologic population.

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Fluorescein Angiography in Ophthalmology

FLUORESCEIN ANGIOGRAPHY has become a fairly common office test for determining the blood flow in the retina and choroid. It has been used to investigate diseases such as macular degeneration and diabetic retinopathy. The ability to determine the cause of fluid in the retina or abnormalities in the retinal vasculature has led to a better understanding of the basic pathophysiology of retinal and choroidal diseases. In turn, the understanding of these entities has led to earlier diagnosis and treatment of these debilitating, ophthalmological diseases.

Fluorescein angiography is done on an outpatient basis. Fluorescein dye (5 to 10 ml) is injected into the antecubital vein as a bolus and serial photographs are taken as the dye passes into the eye from the ophthalmic artery.

A normal fluorescein pattern is seen in Figure 1. As the timed photographs are taken, the advent of leakage from abnormal choriocapillaris areas or retinal vessel breakdowns (or both) become

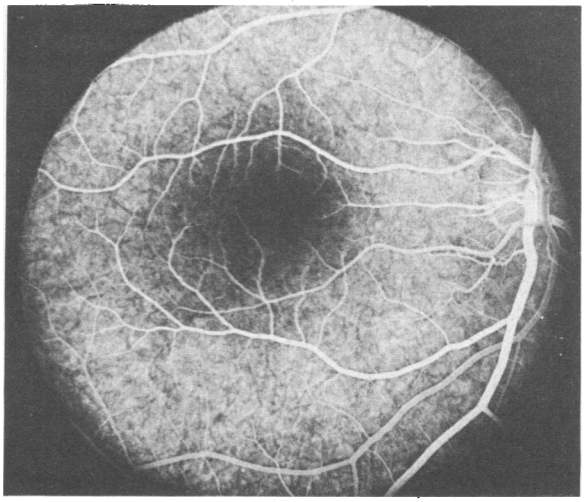

Figure 1.—An angiogram showing a normal fluorescein pattern.

evident. After the choroidal flush becomes apparent, the dye enters the arterial network, which marks the beginning of the arterial phase. The lamellar flow of dye along the edges of the vein marks the beginning of the venous phase and the early venous phase is followed by more uniform filling of the veins. Any abnormal or new retinal vessels as well as old vessels which have undergone deterioration are pinpointed by leakage of the dye through the walls of the abnormal vessels. These leakage spots are pinpointed as bright, white areas of fluorescence which indicate the source of the fluid accumulation in the retina. In many cases, argon laser photocoagulation can be used to seal these areas preventing further deterioration of the retina due to accumulated fluid.

Fluorescein leakage around the optic nerve, which is found in papilledema, is an excellent way of separating cases of papilledema from pseudopapilledema caused by such entities as drusen in the optic nerve head. The test is also useful in determining the presence of ocular tumors. Retinal hemangiomas, metastatic carcinomas and malignant melanomas tend to leak large amounts of the fluorescein dye.

Reactions to the dye can be expected. The patient will have green urine as the dye is excreted by the urinary system. The skin will be slightly pale for 12 hours due to dye absorption. The most frequent complication is nausea, which will occur in about 2 percent of patients at the time the dye is injected and will last from 15 to 30 seconds. In approximately one person in

every 400 a transient rash will develop from 4 to 24 hours after injection of the dye due to allergic manifestations. One person in every 25,000 will have a major allergic reaction with syncope and cardiac problems.

Fluorescein angiography has been used more frequently in the last few years because of its low risk and high information return.

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Continuous Wear Contact Lenses

FOR NEARLY AS LONG as contact lenses have been in use, both doctors and patients have been intrigued by the possibility of continuously or permanently wearing them. Present technology and experience, as well as Food and Drug Administration (FDA) guidelines, dictate the safer and more realistic goal of prolonged or extended wear (that is, weeks or months of uninterrupted use with only periodic cleaning). For this reason, prolonged rather than permanent wear will be the focus of this epitome.

When used by a healthy, capable person for correction of vision, the convenience of prolonged wear would be a tremendous boon. For most elderly aphakic persons, convenience is superseded by near necessity. After cataract extraction the visual difficulties encountered by patients wearing spectacles are well documented. The use of extended wear contact lenses and their associated risks are more easily justified in these patients. Prolonged wear frees elderly aphakic patients from the often incapacitating visual adjustment to glasses and from the need to master the difficult techniques of insertion and removal of regular contact lenses. Many of these patients who have no ophthalmic contraindications to wearing conventional contact lenses are, however, handicapped by deformities, tremor or reduced digital dexterity. Sadly enough, they even have difficulty seeing the lenses.

The major impediment to prolonged wear has been corneal hypoxia. Hypoxia, directly or indirectly, leads to a number of complications including corneal edema, sloughing of the corneal epithelium (the extremely painful overwearing syndrome), increased susceptibility to corneal infection and corneal neovascularization which can interfere with vision.

Actually, modified prolonged wear lenses have been used for more than 20 years by a small number of patients fitted with conventional non-gas permeable "hard" plastic contact lenses. During the waking (eyes open) hours, a properly fitted lens and a good blink reflex allow adequate dissolved oxygen to reach the cornea via the tears. Spontaneous nightly movement of the lens off the cornea and onto the sclera by the patient circumvents the problem of corneal oxygen starvation that exists during sleep with the hypoxic combination of lens in place, closed lids and minimal tear exchange. Some patients can even tolerate very small and thin contact lenses on their corneas without removal.

With the hope of producing a more physiologic prolonged wear device, manufacturers have developed new materials which would provide better corneal oxygenation with the lens left in place during sleep. One such innovation is the "soft" hydrophilic contact lens with its moderate oxygen permeability. These lenses allow adequate oxygenation in the eyes open state, but borderline hypoxia when the lids are closed. Considerable data from the last eight or ten years indicate the relative safety of continuously worn therapeutic hydrophilic lenses. These have been used primarily in the treatment of existing corneal disease. Reported complications of prolonged use include conjunctivitis, corneal edema, corneal opacity formation, infectious corneal ulcers and neovascularization. The magnitude of these difficulties is low enough to justify prolonged wearing in a therapeutic situation.

Recently, both hard and soft contact lens devices with high oxygen flux have been developed specifically for prolonged wear in normal eyes for vision correction. Investigators using these newer lenses in Canada, England, Europe and Japan report encouraging results with few complications. Case studies indicate that 60 percent to 70 percent of well-selected patients can wear these contact lenses for prolonged periods, with cleaning every few months. Long-term, controlled data are not yet available to support these claims.

In the United States, *no* prolonged wear contact lenses are FDA approved for vision correction, although therapeutic fitting is allowed. A num-